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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/541,625

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Heinz-Dieter Metzemacher

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EXAMINER

HU, HENRY S

ART UNIT

PAPER NUMBER

1796

NOTIFICATION DATE

DELIVERY MODE

06/02/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/541,625	Applicant(s) METZEMACHER ET AL.	
	Examiner HENRY S. HU	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Election of March 2, 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to **Election** along with its **Pre-Amendment** filed on March 2, 2009, which is in response to Restriction requirement filed on February 10, 2009. **Applicant's Election of Group I (Claims 1-14 and 32) is made without traverse.** With such a (2nd) pre-amendment, **Claims 1-14 are amended; non-elected Claims 15-31 are cancelled, while new independent Claim 32 is added.** To be specific, parent Claim 1 is further amended so that the preparation of nanoclay is cosmetically rewritten.

This Application is a **371/PCT/EP04/00071**. It is noted that Applicants' **four IDS**' (15 pages total) have been filed so far. **Claims 1-14 and 32 with only one independent claim** (Claim 1) are now pending since all non-elected Claims 15-31 have been cancelled. An action follows.

Specification

2. The disclosure is objected to because of the following informalities:

On the page for abstract, Applicant is reminded of the improper language and format for an abstract of the disclosure.

The abstract has **three** paragraphs. The examiner suggests the removal of the tab on the second and third paragraph starting with "The additive" so that it combines with the first paragraph.

The abstract should be in narrative form and generally **limited to a single paragraph** on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On **Claim 1** at line 1, the writing as “the nanoclay comprises an “organically intercalated swellable” inorganic layered material **which has been surface coated in a dry process with a “pre-exfoliating” additive or additive mixture**” causes indefiniteness. It is unclear which one (the nanoclay or the organically intercalated swellable inorganic layered material) is exactly used to be surface coated in such a dry process. The key point is that the nanoclay is not necessarily to be equivalent to the organically intercalated swellable inorganic layered material. Rewriting is necessary. Otherwise, one having ordinary skill in the art may be confused.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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5. The limitation of parent **Claim 1** in present invention relates to **a pulverulent masterbatch composition “comprising” a nanoclay.**

wherein the nanoclay comprises an “organically intercalated swellable” inorganic layered material which has been surface coated in a dry process with a “pre-exfoliating” additive or additive mixture.

Newly added independent **Claim 32** relates to independent **Claim 1** but using a closed language “**consists of**” for the same composition.

*See other limitations of dependent **Claims 2-14.***

6. **1-4 and 32 are rejected** under 35 U.S.C. 103(a) as being obvious over **Lee et al. (US 6,828,371 B2)** in view of **Rajagopalan et al. (US 7,208,546 B2)** and **Sullivan et al. (US 6,802,784 B2).**

Regarding using “**modified nanoclay**” in making “**pulverulent masterbatch composition**” of **two** parent claims including **Claim 1 and Claim 32**, said modified clay is achieved by **comprising** (for Claim 1) or **consisting of** (for Claim 32) an “**organically intercalated swellable” inorganic layered material** which has been **surface coated in a dry process with a “pre-exfoliating” additive or additive mixture** as disclosed in its dependent Claim 5. It is noted that open language “**comprising**” is applied to the masterbatch composition (which comprising a nanoclay).

7. Lee et al. have already prepared some “**polymer/layered filler nanocomposite to be used as masterbatch composition**” in the form as a pellet” by sonicating a mixture of thermoplastic polymer and the filler such as nanoclay and the like layered filler. See abstract; working examples 9, 11 and 14.

8. Lee is thereby silent about using the specific-modified nanoclay as disclosed in parent Claims 1 and 32. **Two** references including **Rajagopalan and Sullivan** in combination have taught such a subject matter. **Rajagopalan** teaches that **layered material such as clay can be intercalated with the intercalant polymer.** By doing so, interlayer’s spacing can be **expanded** (see line 26-27) **or swelled** (see line 10-12) to at least 10 Å°. See column 4, line 8-48. **Sullivan** teaches that **layered and the like filler material can be exfoliated by heating** and then can be bonded with some **organic materials and/or auxiliary materials.** The exfoliated process involves heating the filler at temperature of greater than 500 °C. By doing so, the “c” direction of the filler can be expanded to about 100-300 times the pre-treatment thickness. The improved tensile strength of the polymer/layered filler composite will readily improve its **impact strength** (column 4, line 62-64; column 5, line 46-53; column 5, line 66 – column 6, line 15).

9. In light of the fact that all involving references are dealing with working up the **polymer/layered filler nanocomposite or composite**, one having ordinary skill in the art would therefore have found it obvious to modify Lee’s process of making “polymer/layered filler nanocomposite (to be used as masterbatch composition) by two ways including: (A) applying or

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further including the step of exfoliation on layered filler by heating and then bonded with some organic materials and/or auxiliary materials as taught by **Sullivan** and (B) specifically using the “intercalant” polymer as taught by **Rajagopalan**. By doing so, one would expect the pre-exfoliated nanoclay is “indeed” fully intercalated with the intercalant polymer since the interlayer’s spacing on nanoclay has been fully expanded. The improved tensile strength of the polymer/layered filler composite will readily improve its impact strength. Thereby, better nanocomposite is obtained.

10. **Claims 2-4** are all related to the issue on nanoclay. For instance, **Claim 2** relates to **average particle size** of nanoclay, **Claim 3** relates to nanoclay being **ground nanoclay**, while **Claim 4** relates to nanoclay being from **naturally occurring or synthetic phyllosilicates**. The references and the cited references therein have disclosed and/or suggested limitations on using nanoclay. For instance, see Lee at column 7, line 1-6.

11. **Claims 5-14 are rejected** under 35 U.S.C. 103(a) as being obvious over Lee et al. (US 6,828,371 B2) in view of Rajagopalan et al. (US 7,208,546 B2) and Sullivan et al. (US 6,802,784 B2), and further in view of two references including **Metzemacher** et al. (US **5,827,906**) and **Metzemacher** et al. (US **5,139,875**).

The rejections over **Lee/Rajagopalan/Sullivan** set forth above for Claims 1-4 and 32 are incorporated here by reference. The references Lee/Rajagopalan/Sullivan in combination are silent about all the three type limitations of Claims 5-9, 10-11 and 12-14. For instance, **Claims**

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5-9 are related to the use of **fatty acid** and its derivatives for exfoliation of additive, **Claims 10-11** are related to the use of **siloxane polymer** and its derivatives for exfoliation of additive, while **Claims 12-14** are related to the use of **specified polymer** and its derivatives for exfoliation of additive.

Two references including **Metzemacher (906)** and **Metzemacher (875)** have taught such a subject matter so as to make surface-treated additive. For instance, see **Metzemacher (906)** at column 1, line 59 – column 2, line 46; title; abstract, line 1-4 **to use fatty acid or its derivatives** (for Claims 5-9) as well as **to use siloxane and its derivatives** (for Claims 10-11). By doing so, the flame-inhibiting property is improved. See **Metzemacher (875)** at column 2, line 23-60; title; abstract, line 1-3 **to use liquid EPM or EPDM polymer or its like material** (for Claims 12-14). By doing so, the flame-inhibiting property is also improved.

In light of the fact that all involving references are dealing with working up the polymer/filler composite or nanocomposite while the compatibility in between them is the key issue as known in the art, one having ordinary skill in the art would therefore have found it obvious to modify Lee/Rajagopalan/Sullivan's additive by surface treating with fatty acid, siloxane, EPM/EPDM liquid polymer and the like compound or derivative as taught by **Metzemacher (906)** and **Metzemacher (875)**. By doing so, the flame-inhibiting property is also improved. Better masterbatch composition is thereby obtained.

Conclusion

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12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Vasu Jagannathan, can be reached on (571) 272-1119. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Peter D. Mulcahy/
Primary Examiner, Art Unit 1796

/Henry S. Hu/
Examiner, Art Unit 1796

May 26, 2009